CLAIMS

What is claimed is:

1. A hydrodynamic clutch arrangement comprising:

a clutch housing having a drive-side wall for connecting to a drive unit and a takeoff-side wall for connecting to a gearbox;

a pump wheel in the housing;

a turbine wheel in the housing, the turbine wheel and the pump wheel forming a hydrodynamic circuit in the housing; and

a clutch device located inside the housing, the clutch device bringing the housing into and out of working connection with the pump wheel.

2. A hydrodynamic clutch device as in claim 1, wherein the clutch device comprises a separating wall having a first side facing the hydrodynamic circuit and a second side facing the takeoff-side wall of the housing, the clutch device further comprising a control chamber between the second side and the takeoff-side wall, and a first control line connected to a pressure supply system.

3. A hydrodynamic clutch arrangement as in claim 2 comprising a clutch piston which is not rotatable with respect to the housing, the clutch piston forming the separating wall.

4. A hydrodynamic clutch arrangement as in claim 2 wherein the hydrodynamic circuit has a prevailing pressure, the pressure supply system supplying

the control system with a control pressure having a value which is essentially the same as the prevailing pressure.

5. A hydrodynamic clutch arrangement as in claim 4 wherein the pressure control system can switch the pressure in the control chamber between the control pressure and a residual pressure which is less than the control pressure.

6. A hydrodynamic clutch arrangement as in claim 5 wherein the residual pressure is essentially the same as atmospheric pressure.

7. A hydrodynamic clutch arrangement as in claim 3 wherein the clutch piston comprises at least one seal for sealing the hydrodynamic circuit from the control chamber.

8. A hydrodynamic clutch arrangement as in claim 7 wherein the seal allows a predetermined residual leakage between the hydrodynamic circuit and the control chamber.

9. A hydrodynamic clutch arrangement as in claim 3 further comprising at least one friction surface which can be urged toward the takeoff-side housing wall by the clutch piston, the at least one friction surface acting as a seal between the hydrodynamic circuit and the control chamber.

10. A hydrodynamic clutch arrangement as in claim 9 further comprising at least one friction lining, each said friction lining forming a respective said friction surface.

11. A hydrodynamic clutch arrangement as in claim 10 wherein each said friction lining has a first radial area provided with openings which allow the flow of coolant, and a second radial area which is essentially free of interruptions in the circumferential direction.

12. A hydrodynamic clutch arrangement as in claim 10 wherein each said friction lining is provided with openings to allow flow of coolant, the openings extending across the lining in the radial direction.

13. A hydrodynamic clutch arrangement as in claim 12 further comprising a seal located radially inside the at least one friction lining, the seal acting between the clutch piston and the takeoff-side housing wall.

14. A hydrodynamic clutch arrangement as in claim 13 further comprising at least one through channel located radially inside the friction lining and radially outside the seal.

15. A hydrodynamic clutch arrangement as in claim 13 further comprising at least one disk provided with at least one friction lining, the clutch piston cooperating with the at least one disk.

16. A hydrodynamic clutch arrangement as in claim 15 wherein said clutch device is a multi-disk clutch having a plurality of disks arranged axially, said disks comprising said at least one disk having at least one friction lining.

17. A hydrodynamic clutch arrangement as in claim 16 further comprising:

an outer disk carrier which is fixed to one of said pump wheel and said clutch piston, the multi-disk clutch comprising at least one outer disk which is connected to the outer disk carrier non-rotatably but with freedom of axially movement; and

an inner disk carrier fixed to the takeoff-side housing wall, the multi-disk clutch comprising at least one inner disk which is connected to the inner disk carrier non-rotatably but with freedom of axially movement.

18. A hydrodynamic clutch arrangement as in claim 17 wherein the seal is provided between the second side of the clutch piston and the inner disk carrier.

19. A hydrodynamic clutch arrangement as in claim 18 further comprising a seal carrier fixed to the clutch piston, the seal carrier having a recess in which the seal is held.

20. A hydrodynamic clutch arrangement as in claim 16 further comprising at least one flow channel provided in at least one friction surface of at least one disk of the multi-disk clutch.

21. A hydrodynamic clutch arrangement as in claim 17 wherein the takeoff side of the housing and the pump wheel each comprise a hub, the outer disk carrier being connected nonrotatably to one of the pump wheel and the clutch piston, the clutch piston being connected nonrotatably to one of the hubs.

22. A hydrodynamic clutch arrangement as in claim 21 wherein the outer disk carrier is connected nonrotatably to the clutch piston, the clutch piston being connected nonrotatably to the pump wheel hub.

23. A hydrodynamic clutch arrangement as in claim 21 wherein the clutch piston has a radially inner area comprising a base having axial teeth which connect the base nonrotatably but with freedom of axial movement to said one of said hubs.

24. A hydrodynamic clutch arrangement as in claim 21 wherein the takeoff-side housing hub is provided with an axial stop which limits axial travel of the clutch piston toward the pump wheel.

25. A hydrodynamic clutch arrangement as in claim 24 further comprising an axial spring which pretensions the clutch piston toward the takeoff-side housing wall, the axial spring being supported against the axial stop.

26. A hydrodynamic clutch arrangement as in claim 21 further comprising a radially inner seal between the clutch piston and the one of the hubs.

27. A hydrodynamic clutch arrangement as in claim 2 wherein the takeoff-side housing wall comprises a hub having connections for connecting the control chamber to the pressure supply system.

28. A hydrodynamic clutch arrangement as in claim 1 further comprising a bridging clutch for bypassing said hydrodynamic circuit.

29. A hydrodynamic clutch arrangement as in claim 28 wherein said bridging clutch comprises a torsional vibration damper.

30 A hydrodynamic clutch arrangement as in claim 1 wherein the clutch device can be closed by hydraulic pressure within the clutch housing.

31. A hydrodynamic clutch arrangement as in claim 2 wherein the clutch device does not transmit any torque when the hydraulic pressure on the separating wall is that same as that in the control chamber.

32. A hydrodynamic clutch arrangement as in claim 1 wherein the clutch device is opened when the drive unit is started.

33. A hydrodynamic clutch arrangement as in claim 2 wherein the pressure in the control system can be automatically switched by the pressure supply system between the pressure present in the hydrodynamic circuit and a residual pressure which is lower than the pressure present in the hydrodynamic circuit.